

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

CONSERVATION CROP ROTATION

(ACRE)
CODE 328

DEFINITION

Growing crops in a recurring rotation on the same field.

PURPOSES

This practice may be applied as part of a conservation management system that meets the social and economic objectives of the producer and supports the following purpose(s), as applicable.

- Maintain or improve soil organic matter content.
- Reduce soil erosion from wind.
- Reduce sheet and rill erosion.
- Select crops when irrigation water is limited.
- Manage deficient or excess plant nutrients.
- Manage plant pests (weeds, insects, and diseases).
- Manage crop selection on saline soils.
- Provide food for domestic livestock.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all **cropland**. **Cropland** is land planted and tilled annually. Land planted and tilled annually after a perennial crop such as alfalfa or grass for more than two consecutive years is considered cropland also. Orchards, vineyards, or nurseries are not considered cropland. Fallow for one year is considered part of cropland

This standard does not apply to **pasture**, **hayland**, or **other land uses** where annual row or close growing clean up crops are grown occasionally only to facilitate renovation or reestablishment of perennial vegetation. These clean up crops are grown no more than two year consecutively.

CRITERIA

General Criteria Applicable To All Purposes Named Above

All crop rotations will have the Soil Condition Index run for the rotation. Crops selected for the rotation may need to be adjusted to achieve a neutral or positive rating.

Crops shall be grown in a planned, recurring rotation except as outlined in Operation and Maintenance (substitution may be needed).

Crops shall be adapted to the climatic region and the soil and water resources. Adapted crops and varieties shall be selected that are listed in appropriate university publications or other approved sources.

A conservation crop rotation may include crops planted for cover or nutrient management.

Crops shall be selected that produce sufficient quantities of biomass at the appropriate time to reduce erosion by wind and water to acceptable soil loss levels. In those instances where crops selected do not produce sufficient biomass to meet this criteria, a cover crop (see Cover Crop, 340) or other appropriate practice shall be used. The amount of biomass needed shall be determined using the current approved erosion

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the natural Resources Conservation Service.

prediction technology. Soil loss estimates shall account for the effects of other practices in the conservation management system.

Additional Criteria To Maintain Or Improve Soil Organic Matter Content

Crops shall be selected that produce the amount of plant biomass needed to maintain soil organic matter content, as determined using the current approved Soil Condition Index (SCI) procedure.

When the SCI is used to evaluate the cropping rotation, the composite rating for the entire rotation will **be greater than or equal to zero**. Refer to NM Agronomy Technical Note No. 42 for help.

<http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/ag42.doc> and
<http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/ag42.xls>

If partial removal of residue by means such as baling or grazing occurs, enough residue shall be maintained to achieve the desired soil organic matter content goal (SCI equal to or greater than zero).

Cover and green manure crops planted specifically for soil improvement may be grazed; as long as grazing is managed to retain adequate biomass make the rotation meet SCI.

Additional Criteria to Reduce Soil Erosion from Wind

Crops shall be selected that produce biomass in amounts adequate, and at the appropriate time, to control erosion to within the soil loss objective.

The amount of biomass needed shall be determined using current approved wind erosion prediction technology. Calculations shall account for the effects of other practices and/or tillage operations in the conservation management system. See Agronomy Technical Note 55 at: <http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/ag55.doc> and <http://www.nm.nrcs.usda.gov/techserv/fotg/jobsheets/js590.xls>

Additional Criteria to Reduce Sheet and Rill Erosion

Crops shall be selected that produce enough above and below ground plant biomass to control water erosion within the soil loss objective.

The amount of biomass needed shall be determined using current approved erosion prediction technology. Sheet and rill erosion will be computed using the revised universal soil loss equation (RUSLE I). See Agronomy Technical Note 28 at:

<http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/AG28.doc>

Calculations shall account for the effects of other practices in the conservation management system.

Select Crops When Irrigation Water is Limited

Irrigation water is limited and metered in some parts of NM. This causes producers to select crops based on the amount of water needed to meet the restriction imposed on them (amount of water they allowed to use). Crop shall be selected using the yearly consumptive use requirements of crops listed in the Irrigation Water Management Guide. See the guide at:

<http://www.nm.nrcs.usda.gov/techserv/sec1home.htm>

The guide will allow crops to be selected in the rotation that will meet the water restrictions. The water needs can be noted on the NM-CONS-213A or B form.

Additional Criteria to Manage Deficient or Excess Plant Nutrients

Crop selection and rotation shall be determined using an approved nutrient balance procedure. Use the procedure specified in the Nutrient Management Standards (590). See the standard at: <http://www.nm.nrcs.usda.gov/techserv/sec4.htm>

When crop rotations are designed to add nitrogen to the system, nitrogen-fixing crops shall be grown immediately prior to or interplanted with nitrogen depleting crops.

To reduce excess nutrients, crops or cover crops shall be grown having rooting depths and nutrient requirements that utilize the excess nutrients.

Additional Criteria to Manage Plant Pests (Weeds, Insects, Diseases)

Crops shall be alternated to break the pest cycle and/or allow for the use of a variety of other control methods. Affected crops and alternate host crops shall be removed from the rotation for the period of time needed to interrupt the life cycle of the targeted pest. Refer to the Pest Management Specification, 595. See standard at: <http://www.nm.nrcs.usda.gov/techserv/sec4.htm>

Resistant varieties, listed in appropriate University publications or other approved sources, shall be selected where there is a history of a pest problem.

Manage Crop Selection on saline soils

Crops for the rotation shall be selected based on, the maximum allowable soil salinity level (Electrical Conductivity) at the threshold level of a 10% yield reduction. Use guidance provided in the Water Quality Section of the NM Irrigation Guide. See the guide at:

<http://www.nm.nrcs.usda.gov/techserv/sec1home.htm>.

Also refer Toxic Salt Reduction standard at:

<http://www.nm.nrcs.usda.gov/techserv/sec4.htm>.

Additional Criteria to Provide Food for Domestic Livestock

Crops shall be selected to balance the feed supply with livestock numbers. The needed amount of selected crops shall be determined using an approved forage-livestock balance procedure, NM Range 3 (Worksheet for practice 528A3). See the worksheet at:

[http://www.nm.nrcs.usda.gov/techserv/fotg/jobsheets/ws528a\(3\).doc](http://www.nm.nrcs.usda.gov/techserv/fotg/jobsheets/ws528a(3).doc). Specify the crop that will be grazed.

Additional Criteria to Provide Food and Cover for Wildlife

Crop selection to provide either food and or cover for the targeted wildlife species will be grown, managed, or left unharvested as per the needs of the targeted wildlife as determined by the New Mexico Wildlife Habitat Evaluation Guide (WHEG).

Crop selection shall be evaluated using a specific WHEG for the featured animal. The WHEG score before and after, and the crop that provides the food and or the cover will be listed in the Jobsheet. See the WHEG at:

<http://www.nm.nrcs.usda.gov/techserv/sec1home.htm>

CONSIDERATIONS

An important purpose of conservation crop rotation is maintenance of good soil physical condition through the recycling of organic matter. However, in areas which crops are subject to wind erosion, a key consideration during planning must also be erosion control.

When used in combination with Cross Wind Stripcropping (589B), the crop rotation should be consistent with the stripcropping design.

Select high residue producing crops and varieties and use cover crops with residue management practices to control erosion.

Where erosion induced by sprinkler irrigation or irrigation runoff is a concern, the hazard can be reduced by basin tillage (dammer-diker), residue management, and the application of Anionic Polyacrylamide (PAM) Erosion Control.

Maintaining or improving soil organic matter content, can be enhanced by managing crop residues, utilizing animal wastes, or applying mulches to supplement the biomass produced by crops in the rotation.

Where excess plant nutrients or soil contaminants are a concern, rotating deep rooted crops or cover

crops with shallow rooted crops can help recover the nutrient or contaminant from the soil profile.

Soil moisture can be conserved for crop use by maintaining crop residues on the soil surface to increase infiltration and to reduce runoff and evaporation. No-till can conserve as much as 1.5 inches of moisture over conventional tillage. Where winter precipitation occurs as snow, additional moisture can be obtained for crop use by trapping snow with standing residue, windbreaks, or other barriers.

Selecting crops which are tolerant to abrasion from wind blown soil or tolerant to high wind velocity can reduce crop damage by wind. If crops sensitive to wind erosion damage are grown, the potential for plant damage can be reduced by crop residue management, field windbreaks, herbaceous wind barriers, intercropping, or other methods of wind erosion control.

Soil compaction may be reduced when rotations including deep rooted crops are used in combination with subsoiling, controlled traffic, or management of grazing animals to prevent, or breakup, compacted layers.

Salt tolerance of crops varies considerably among species but also is highly dependent on cultural conditions. Yield response relations show that crops tolerate salinity up to a threshold level. Salinity levels that exceed this threshold result in linear yield decreases as salinity increases.

As the salt contents of irrigation waters increase, greater care must be taken to plant crops tolerant to the expected salinity and to take appropriate steps to manage root zone salt accumulations through proper leaching techniques. See the Irrigation Leaching Index and Salt Management Tool for assistance. See the worksheet and technical note at:

<http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/ag61.doc> and
<http://www.nm.nrcs.usda.gov/techserv/TechNotes/agro/ag61.xls>

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation & Maintenance described in this standard.

A jobsheet or other similar documentation will be filled out using the criteria listed above.

OPERATION AND MAINTENANCE

Rotations shall provide for acceptable substitute crops in case of crop failure or shift in planting intentions for weather related or economic reasons. Acceptable substitutes are crops having similar properties that meet the criteria for all the resource concerns identified for the field or treatment unit.

In areas where summer fallow is practiced, fields shall be fallowed when soil moisture is not adequate to produce a crop.